alvarion®
Your Open WiMAX Choice

BreezeACCESS® VL

Broadband Wireless Access with Toll Quality Voice

BreezeACCESS VL, Alvarion's broadband wireless platform in the 5 GHz frequency, is part of the BreezeACCESS product family, the world's most deployed wireless broadband platform. Superior features such as non-line-of-sight (NLOS), extended reach, high capacity in all packet sizes, encryption, and end-to-end QoS for time critical applications are key to its success in deployments worldwide.

Increase revenue from offering toll quality voice over IP (VoIP) and other triple play services through the use of quality of service algorithms (QoS), multimedia application prioritization (MAP) for wireless link prioritization, and unprecedented high capacity in all packet sizes. BreezeACCESS VL supports hundreds of simultaneous calls per sector.

With BreezeACCESS VL, operators offer a wide variety of services and applications, including VoIP, wireless leased line, hotspot feeding, gaming services, secure VPNs, video surveillance and wireless xDSL in urban and rural environments, and all at reduced capital and operating costs than wired alternatives.

Choose BreezeACCESS VL for:

- Video and voice with end-to-end quality of service supporting an unmatched number of hundreds of toll quality calls per sector
- Connecting communities - for cost-effective access within communities, municipalities and educational institutions
- Hotspot feeding - high throughput, reliable service
- Security and surveillance - wireless cameras transmitting bandwidth hungry video and requiring secure reliable services
- Last mile access - services for both residential and business users with NLOS capabilities for all environments, rural and urban
- Enterprise networks - leased line replacement for cost effective connectivity, providing VoIP and data services in enterprises and campuses

Reasons for Choosing BreezeACCESS VL

Economic Advantages

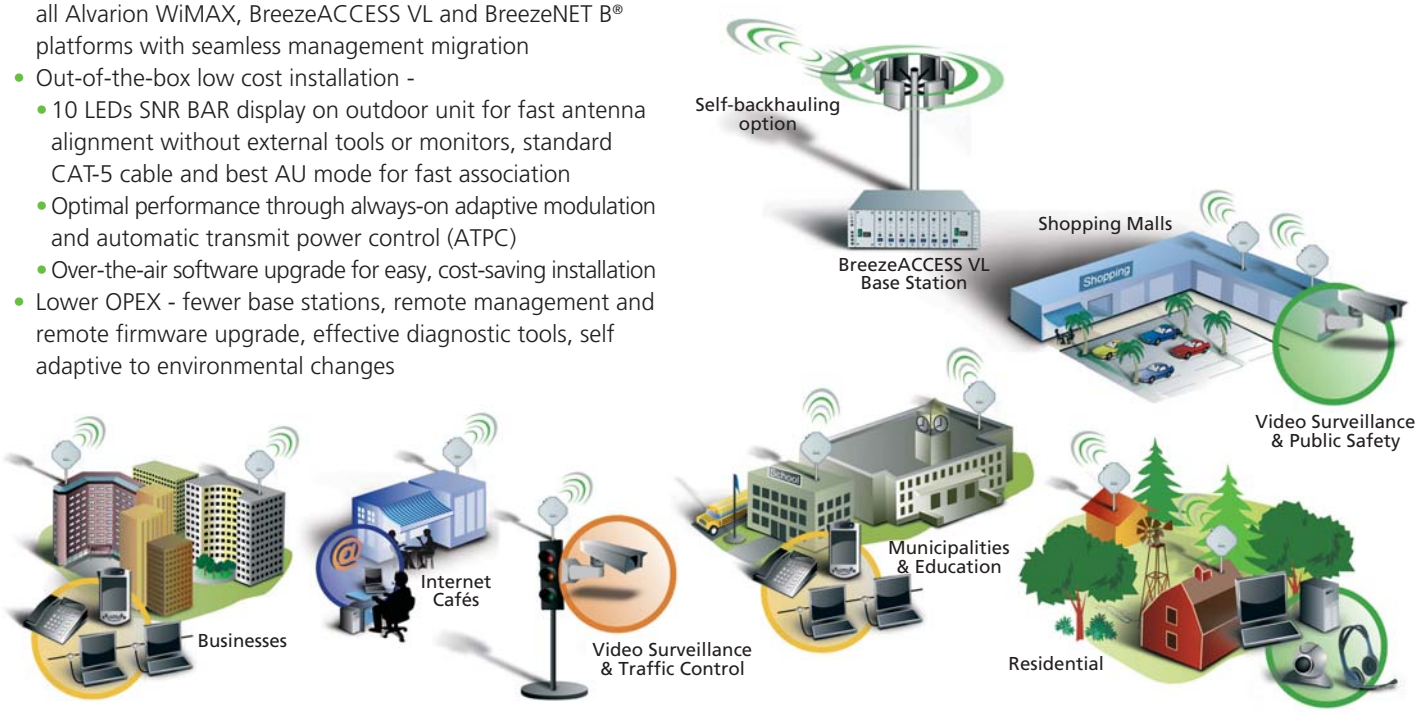
- More revenues by providing subscribers toll quality voice and video services with differentiated price packages for multiple speeds and upgrade options
- Less infrastructure investment today - NLOS, high capacity, outstanding coverage, multi-subscriber profiles in same sector and network, modular and flexible "pay-as-you-grow" enables fewer base stations and site constructions
- Lower CAPEX tomorrow - protect your investment for co-location with future WiMAX systems. Both sets of CPEs (BreezeACCESS VL and BreezeMAX™) are able to operate at the same sector. AlvariSTAR™ management tool will support all Alvarion WiMAX, BreezeACCESS VL and BreezeNET B® platforms with seamless management migration
- Out-of-the-box low cost installation -
  - 10 LEDs SNR BAR display on outdoor unit for fast antenna alignment without external tools or monitors, standard CAT-5 cable and best AU mode for fast association
  - Optimal performance through always-on adaptive modulation and automatic transmit power control (ATPC)
  - Over-the-air software upgrade for easy, cost-saving installation
- Lower OPEX - fewer base stations, remote management and remote firmware upgrade, effective diagnostic tools, self adaptive to environmental changes

Technological Advantages

- Wide coverage, more customers with fewer base stations
- Multimedia Application Prioritization (MAP) using wireless link prioritization for full end-to-end QoS
- Unique dynamic resource allocation protocol (DRAP) with Alvarion's voice gateways ensuring high quality voice, while maintaining residual capacity for best effort data services
- Very high capacity and packet processing for best network performances and high number of VoIP calls
- DFS+ (dynamic frequency selection) for countries that require it, plus an Alvarion only algorithm to improve channel management under certain conditions of low radar activity
- Best access unit (AU) selection - for fast and simple SU association with best AU detected, also acts as a redundancy mechanism that automatically selects second best AU if best AU fails
- Flexible network planning - Supports 10 and 20 MHz subchannel options for radio planning and interference avoidance with automatic subchannel search
- Rugged, widely deployed robust solution in 5 GHz

Management Advantages

- AlvariSTAR - a comprehensive network management support tool with scalable architecture, topology management, configuration and monitoring, fault management, and performance monitoring
- BreezeCONFIG - a configuration and monitoring utility that is intuitive and simple to use and enables simultaneous firmware upgrades for multiple CPEs



Extensive Access Suite Features

- Bridging functionality - simple configuration, fast installation 802.1Q VLAN support with trunk, access and hybrid and QinQ 802.ad modes
- QoS - end-to-end QoS with MAP using packet prioritization
- SLA enforcement - supports committed information rates (CIR) and maximum information rates (MIR) per user, per direction; packet prioritization with IP TOS, VLAN, DiffServ and UDP/TCP port range classification, and graceful degradation in case of congestion

Security and Filtering Options

- AES 128 and WEP 128 encryption options - and new FIPS-197 encryption mode, certified according to Federal Information Processing Standards, access/denial list enabling only authorized CPEs to connect
- Access control with IP address protocol and MAC based filtering, offering better control including being able to limit the number of authorized IP addresses, enabling an additional source of revenue or for preventing local broadcasts from flooding the wireless link

Flexibility and Modularity

- Flexible topology allowing stand-alone or chassis based configurations for modular and scalable solutions enabling "pay as you grow". Deployable in multiple sectors using various antenna choices
- AC and DC power supply options
- Supports 3, 6 and 54 Mbps CPE rates with attached and external antenna options
- Upgradeable CPE bandwidth over the air

The Complete Spectrum™ Solution

- Covers the entire 5 GHz band and easily integrates with BreezeACCESS's 900 MHz, 2.4 GHz, 3.5 and 4.9 GHz bands using the same infrastructure and range of technologies
- Supports concurrent LOS, NLOS and multi-frequencies with subscriber speeds from 3 to 54 Mbps
- Permits operators to customize networks for various market segments to achieve the highest revenue per cell

Robustness and Reliability

- Adaptive modulation with 8 rates schemes and smooth changes between rates responding to link conditions, facilitating link robustness, set at the highest per customer rate possible
- Automatic transmit power control (ATPC) - the access unit automatically measures and adjusts the subscriber unit's transmission power, enabling easier installation and optimizing network performance
- Supports various redundancy options
- Built in Forward Error Correction and retransmission correcting lost and damaged bits
- Full outdoor rated equipment option with OPS-AC-HD

System Components

The BreezeACCESS VL solution consists of a base station and customer premises equipment (CPE) units. The base stations are available as either modular or stand-alone micro cell units. CPEs are available in various models for differing bandwidths and single or multiple user configurations.

Access Units (AUs)

Installed at the base station site, each AU includes indoor and outdoor units. The indoor connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and to the outdoor unit is connected to the indoor unit through a CAT-5 cable. Alvarion offers two types of base stations:

- The modular shelf base station (BS-SH-VL) 19" 3U universal chassis holding up to 6 AU modules. Two power supply modules can be used in a BS-SH-VL chassis (either AC or DC) for fail-safe operation. The AU-D-BS kit includes a chassis based indoor unit, pole mounted outdoor unit and sector antennas.

- The stand-alone micro base station (AU-D-SA) kit includes a small indoor unit, pole-mounted outdoor unit and a sector antenna.

A variety of antennas can be used with the base station: 360, 120, 90 and 60 degrees.

Subscriber Units (SUs)

The subscriber unit (SU) enables customer connection with the base station and supports single or multiple end users. SUs provide an efficient platform for always-on, high-speed Internet and Intranet, VoIP, VPN and other services.

Each SU connects to the network through a standard Ethernet 10/100BaseT (RJ-45) interface and connects to its outdoor part via CAT-5 cable. Each SU kit includes a single data port indoor unit, CAT-5 indoor-outdoor cable, pole mounted outdoor unit and integrated antenna in most cases. Several subscriber unit add-on modules are available including; the networking gateway that offers residential, SOHO and SME subscribers a flexible range of wireless and wireline networking services and the voice gateway that offers the efficient provision of voice and data.

Several CPE models are available (ff - frequency band):

- The SU-A-ff-3-1D-VL supports gross rate of up to 3 Mbps for a single user, includes integrated antenna
- The SU-A-ff-6-BD-VL supports gross rate of up to 6 Mbps for multiple users, includes integrated antenna
- The SU-A-ff-54-BD-VL supports gross rate of up to 54 Mbps for multiple users, includes integrated antenna
- The SU-E-ff-54-BD-VL supports gross rate of up to 54 Mbps for multiple users, does not include antenna

Headquarters

International Corporate Headquarters
Tel: +972.3.645.6262
Email: corporate-sales@alvarion.com

North America Headquarters
Tel: +1.650.314.2500
Email: n.america-sales@alvarion.com

Sales Contacts

Australia
Email: australia-sales@alvarion.com

Brazil
Email: brazil-sales@alvarion.com

Canada
Email: canada-sales@alvarion.com

Caribbean
Email: caribbean-sales@alvarion.com

China
Email: china-sales@alvarion.com

Czech Republic
Email: czech-sales@alvarion.com

France
Email: france-sales@alvarion.com

Germany
Email: germany-sales@alvarion.com

Hong Kong
Email: hongkong-sales@alvarion.com

Italy
Email: italy-sales@alvarion.com

Ireland
Email: uk-sales@alvarion.com

Japan
Email: japan-sales@alvarion.com

Latin America
Email: lasales@alvarion.com

Mexico
Email: mexico-sales@alvarion.com

Nigeria
Email: nigeria-sales@alvarion.com

Philippines
Email: far.east-sales@alvarion.com

Poland
Email: poland-sales@alvarion.com

Romania
Email: romania-sales@alvarion.com

Russia
Email: info@alvarion.ru

Singapore
Email: far.east-sales@alvarion.com

South Africa
Email: africa-sales@alvarion.com

Spain
Email: spain-sales@alvarion.com

U.K.
Email: uk-sales@alvarion.com

Uruguay
Email: uruguay-sales@alvarion.com

For the latest contact information in your area, please visit:
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Specifications

Radio

Frequency	4.900 - 5.100 GHz, 5.15 - 5.35 GHz, 5.47 - 5.725 GHz, 5.725 - 5.850 GHz								
Radio access method	Time Division Duplex (TDD)								
Channel	10 MHz, 20 MHz								
Central frequency resolution	5 MHz, 10 MHz								
Max output power (at antenna port)	AU: -10 dBm to 21 dBm, 1 dB steps SU: -10 dBm to 21 dBm, automatically adjusted by ATPC Actual max power may be limited for compliance with local regulation								
Sensitivity, typical (dBm at antenna port)	Modulation	1	2	3	4	5	6	7	8
	Level* (20 MHz)	-89	-88	-86	-84	-81	-77	-73	-71
	Level* (10 MHz)	-92	-91	-89	-87	-84	-80	-76	-74
	* Modulation Level combines modulation scheme and coding gain.								
Modulation scheme (Adaptive)	OFDM: BPSK, QPSK, QAM 16, QAM 64								
Antenna port (AU-RE)	N-Type 50 ohm								
Subscriber integrated antenna	20 dBi (19 dBi in 4.9-5.1 GHz band), 10.5° H/V, Integrated flat panel								
AU antennas	60°: 16 dBi, Sector 60° horizontal, 10° vertical 90°: 16 dBi, Sector 90° horizontal, 6° vertical 120°: 15 dBi, Sector 120° horizontal, 6° vertical , 360°: 8 dBi, Sector 360° horizontal, 9° vertical (AU-SA only)								

Data Communication

VLAN support	Based on IEEE 802.1q , QinQ 802.3ad
Layer-2 traffic prioritization	Based on IEEE 802.1p
Layer-3 traffic prioritization	IP ToS according to RFC791 and DSCP according to RFC2474
Layer-4 traffic prioritization	UDP/TCP port range
Security	WEP 128-bit authentication, AES 128, WEP 128, and certified FIPS-197 mode built in encryption

Configuration and Management

Local & remote management	SNMP based NMS and windows based configuration utility, Telnet
Remote management access	From wired LAN, wireless link
Management access protection	Multilevel password Configuration of remote direction (from Ethernet only, wireless only, or both sides) Configuration of IP addresses of authorized stations
Software upgrade	Via TFTP and FTP
Configuration up/download	Via TFTP and FTP
SNMP agents	SNMP v1 client, MIB II, Bridge MIB, Private BreezeACCESS VL MIB

Physical and Electrical

Type	Connectors		Electrical
SU-NI, AU-NI	Ethernet	10/100BaseT RJ-45, 2 embedded LEDs	Power consumption 25W AC input: 100-240VAC, 50/60Hz
	Radio	10/100BaseT Ethernet RJ-45	
	AC IN	3-pin AC power plug	
SU-RA, AU-RE	Indoor	10/100Base RJ-45 with waterproof sealing assembly	54 VDC from indoor to outdoor
AU-BS	Ethernet	10/100BaseT RJ-45, 2 embedded LEDs	Power consumption 30W (module plus outdoor unit) AC input: 100-240VAC, 50/60Hz 3.3VDC, 54V from power supply in backplane
	Radio	10/100BaseT Ethernet RJ-45	
BS-PS AC (AC power supply)	AC-IN	3-pin power plug	Power consumption: 240W, full chassis (1 PS, 6 AU) AC input: 85-265VAC, 47-65Hz DC output: 54V, 3.3V
BS-PS-DC (DC power supply)	-48 VDC	3-pin DC D-Type 3 power pin plug Amphenol	Power consumption: 240W, full chassis (1 PS, 6 AU) DC input: -48 VDC nominal (-34 to -72), 10 A max. DC output: 54V, 3.3V

Standards Compliance

Type	Standard	
EMC	FCC Part 15 class B, CE ETSI EN 301 489-1/4	
Safety	UL 60950-1, EN 60950-1	
Environmental	Operation	ETS 300 019 part 2-3 class 3.2E for indoor units ETS 300 019 part 2-4 class 4.1E for outdoor units
	Storage	ETS 300 019-2-1 class 1.2E
	Transportation	ETS 300 019-2-2 class 2.3
Lightning protection	EN 61000-4-5, class 3 (2kV)	
Radio	FCC part 15	EN 301 753 EN 301 021 EN 301 893 (V 1.3.1)

Note: Not all options are available in all regions and some features require software licensing key. Please contact your local representative for further information

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